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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
POU919980103US1

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JUL 01 2004
PATENT & TRADEMARK OFFICE

In Re Application Of: Thomas A. Gregg

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
09/740,440	12/19/2000	Angel L. Casiano	23405	2182	4913

Invention: **COMMUNICATING BETWEEN ZONES OF A CENTRAL PROCESSING COMPLEX**

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COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **May 6, 2004**

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☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

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Signature

Dated: **June 29, 2004**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant:	Thomas A. Gregg	Confirmation No.:	4913
Serial No.:	09/740,440	Group Art Unit:	2182
Filed:	12/19/00	Examiner:	Angel L. Casiano
Title:	COMMUNICATING BETWEEN ZONES OF A CENTRAL PROCESSING COMPLEX		

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Date of Signature: June 29, 2004.

To: Mail Stop Appeal Briefs - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Brief of Appellants

Dear Sir:

This is an appeal from a final rejection, dated January 2, 2004, rejecting claims 1-46, all the claims being considered in the above-identified application. This Brief is accompanied by a transmittal letter authorizing the charging of appellants' deposit account for payment of the requisite fee set forth in 37 C.F.R. §1.17(c).

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Real Party In Interest

This application is assigned to **International Business Machines Corporation** by virtue of an assignment executed by the inventor on December 19, 2000, and recorded with the United States Patent and Trademark Office at reel 011391, frame 0803, on December 19, 2000. Therefore, the real party in interest is **International Business Machines Corporation**.

Related Appeals and Interferences

To the knowledge of the appellant, appellant's undersigned legal representative, and the assignee, there are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the instant appeal.

Status of Claims

This patent application was filed on December 19, 2000 with the United States Patent and Trademark Office. As filed, the application included forty-six (46) claims, of which six (6) were independent claims (i.e., claims 1, 18, 21, 38, 41 and 46).

In a first substantive Office Action, dated May 28, 2003, the drawings were objected to as failing to comply with 37 CFR 1.84(p)(5); the title was objected to as being not descriptive; and claims 1-2, 4-14, 16-20, 41 and 43-46 were rejected under 35 U.S.C. §102(e), as being anticipated by Wright et al. (U.S. Patent No. 6,195,739B1). Additionally, claims 3, 15, 21-37, 38-40 and 42 were rejected under 35 U.S.C. §103(a) as being anticipated by Wright et al. In appellant's response, dated September 25, 2003, the drawings and title were amended to overcome the objections; and claims 1, 18, 21, 38, 41 and 46 were amended.

In a second and final Office Action, dated January 2, 2004, claims 1-46 were rejected under 35 U.S.C. §103(a) on Wright et al. in view of Tarui et al. (U.S. Patent No. 6,510,496B1). Appellant's response, dated April 2, 2004, argued the patentability of claims 1-46 over Wright et al. and Tarui et al.

Appellant received an Advisory Action, dated April 19, 2004, which indicated that appellant's response to the final Office Action did not place the application in condition for allowance and would not be entered for purposes of appeal.

A Notice of Appeal to the Board of Patent Appeals and Interferences was filed on May 3, 2004. The status of the claims is therefore as follows:

Claims allowed – none;

Claims objected to – none;

Claims rejected – 1-46; and

Claims canceled – none.

Appellants are appealing the rejection of claims 1-46.

Status of Amendments

The claims as set forth in the Appendix include all prior entered claim amendments.

Summary of Invention

The appellant's invention is directed to movement of data among zones of a central processing complex (202), whereby the zone to which data is to be moved is dynamically selected (claims 1, 18, 21, 38, 41 and 46). In one aspect of the appellant's invention, the central processing complex (202) is logically partitioned, as described in appellant's specification, for example, on page 8, lines 22-24. The zone to receive the data is dynamically selected by, for instance, indicating the zone and address to which the data is to be sent (e.g., specification, page 19, lines 1-12). Since the destination zone is dynamically selected, the zones do not have to be preset to one another.

In another aspect of the appellant's invention, a data mover (208) moves data among different operating system zones (204), among different coupling facility zones (206), or any combination thereof (e.g., specification, page 9, lines 27-28, through page 10, lines 1-13).

The data mover moves the data between the various zones without requiring a channel interface or processor instructions (e.g., claims 1, 21 and 41).

In a further aspect of the appellant's invention, a method and corresponding system (e.g., Figures 7-9) of moving data among zones of a central processing complex comprises moving data from one zone to another zone, where the moving comprises, for example: creating one or more queue entries associated with a message requesting the move; generating one or more fetch memory requests for the one or more queue entries to fetch the data from a memory of the one zone; using the one or more fetch memory requests to fetch the data from the memory of the one zone; placing the fetched data in one or more line buffers; generating one or more store memory requests using the fetched data placed in the one or more line buffers; and employing the one or more store memory requests to store the fetched data in a memory of the another zone (e.g., claims 18, 38 and 46).

Issue

1. Whether claims 1-46 were obvious under 35 U.S.C. §103(a) over Wright et al. in view of Tarui et al.

Grouping of Claims

Since there is only one ground of rejection of claims 1-46, there is only one group of claims: Group I, claims 1-46.

Appellants respectfully submit that the claims of Group I do not stand or fall together. In particular, claims 1, 18, 21, 38, 41 and 46 are each believed to include additional features that provide a separate basis for patentability.

Argument

As noted, claims 1-46 stand rejected as obvious over Wright et al. in view of Tarui et al. Reversal of this rejection is respectfully requested.

Initially, the appellant respectfully traverses the suggested combination of Wright et al. and Tarui et al. The justification given for the combination is to obtain an efficient, low cost method for moving data and further to provide a method capable of performing fault containment between *logical* partitions and improving system performance. The Final Office Action refers to Tarui et al., column 2, lines 1-9, for this justification. The appellant respectfully submits that although this reference to Tarui et al. (wherein the Office Action inserts the term "logical") does involve fault containment between partitions, Tarui et al. do not deal with moving data among partitions, but rather with memory allocation. Wright et al., on the other hand, do not deal with memory allocation, but with movement of data in a pipelined processing engine. The applicants thus respectfully submit that there is not an adequate teaching, suggestion or incentive in the art to support the justification to combine these references in the manner set forth in the final Office Action. Indeed, the appellant respectfully submits that it is not even possible to combine the references, as suggested.

Wright et al. deal with one large operating system. The system of Wright et al. does not involve any partitions, either logical or physical. Specifically, Wright et al. describe moving transient data from one stage to another in a "pipelined" processing engine. In particular, as described in Wright et al., column 9, lines 20-28:

> [A]n aspect of the processor complex architecture is the ability of the CPU 410 to operate on the transient data substantially simultaneously with the passing of that data among adjacent context memories by the data mover 450. Specifically, the context memories CMA and CMB function as ping-pong buffers by allowing the CPU core to process context data stored in one of the buffers as the other buffer is loaded with the context data received from *an adjacent "upstream" processor complex*. [emphasis added]

Wright et al. thus describe a pipelined process whereby data is moved in a serial manner such that the address of the next memory location is predetermined. In particular, as shown in FIG. 3 and described in column 8, lines 40-44, the processing elements of Wright et al. are preset to one another. That is, data from one processing element always moves to the same adjacent processing element. Therefore, the path is static; i.e., there is no selection, dynamic or otherwise, to which processing element the data is to be sent.

In contrast to the pipelined process of Wright et al., the appellant deals with movement of data among zones in a central processing complex, whereby the zone to which data is to be moved is dynamically selected, as recited by the appellant in claims 1-46, as amended. The Office Action states that "the cited disclosure does not explicitly teach 'dynamically' selecting the zone of the central processing complex." The appellant agrees that Wright et al. do not explicitly teach dynamic selection of the zone. Indeed, Wright et al. do not implicitly teach or even suggest dynamic selection of the zone because in Wright et al., the zone is *predetermined* as the next adjacent downstream zone.

On the other hand, Tarui et al. deal with allocating shared memory among physical partitions in a multiprocessor system. Specifically, Tarui et al. provide an address management scheme, including an address translator circuit, for shared memory. In all partitions of the system, the shared memory has the same address map. (See Tarui et al., column 16, lines 43-61.) Tarui et al. provide for dynamic allocation of the shared area. In particular, as explained by Tarui et al. in column 3, lines 40-44, dynamic allocation of shared memory involves dynamic modification of the configuration information of the shared area between partitions in order to allow for flexible management of the shared area.

Hence, whereas Wright et al. deal with predetermined movement of data in a pipelined processing engine, Tarui et al. deal with dynamic allocation of shared memory among partitions in a multiprocessor system. Furthermore, Wright et al. deal with a non-partitioned system, while Tarui et al. are concerned with a physically partitioned system. The appellant thus respectfully submits that the principles of Tarui et al. are not applicable to Wright et al, or vice versa. Moreover, even assuming *arguendo* that Wright et al. and Tarui et al. could be combined, the appellant respectfully submits that Tarui et al. do not correct the deficiency of Wright et al. noted in the Office Action with respect to dynamic selection of a zone for movement of data. This is because Tarui et al. do not deal with movement of data, but rather with allocation of memory. That is, the dynamic allocation of shared memory, as described by Tarui et all, is not equivalent to dynamic selection of the zone in a central processing complex to which data will be moved, as recited by the appellant in his amended independent claims 1, 18, 21, 38, 41 and 46. Although both are dynamic processes, that is

where the similarity ends. In particular, as explained by Tarui et al., dynamic allocation of shared memory involves dynamic modification of the configuration information of the shared area between partitions in order to allow for flexible management of the shared area (see Tarui et al., column 3, lines 40-44). By way of contrast, dynamic selection of the zone to which data is to be moved in accordance with the appellant's invention does not involve any reconfiguration of a shared area, but involves dynamically determining to which zone in a central processing complex data is to be moved, as recited by the appellant in his amended independent claims 1, 18, 21, 38, 41 and 46.

Regarding the issue of partitions, the appellant respectfully submits that Wright et al. do not deal with any partitions, but Tarui et al. are concerned with a physically partitioned system, as noted hereinabove. Therefore, as to the alleged combination of references, the applicant respectfully submits that there is a further deficiency with respect to support for the combination. Moreover, as set forth in the appellant's specification, for example, on page 8, lines 22-24, and on page 10, lines 14-15, the appellant's invention is particularly useful in a logically partitioned system. Neither Wright et al. nor Tarui et al. deal with logical partitions. Thus, the appellant respectfully submits that the suggested combination of Wright et al. and Tarui et al., assuming *arguendo* that the combination were possible, would not render obvious or motivate the appellant's invention.

In view of the differences noted above, the appellant respectfully submits that his invention as recited in independent claims 1, 18, 21, 38, 41 and 46 would not have been obvious to one of ordinary skill in the art under 35 U.S.C. §103(a) based upon the suggested combination of Wright et al. and Tarui et al. Therefore, reversal of the obviousness as rejection to these claims is respectfully requested.

The dependent claims are believed to patentable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their own additional characterizations.

For example, in one aspect of the appellant's invention, a data mover moves data among different operating system zones, among different coupling facility zones, or any

combination thereof. The data mover moves the data between the various zones without requiring a channel interface or processor instructions, as recited in claims 1, 21 and 41.

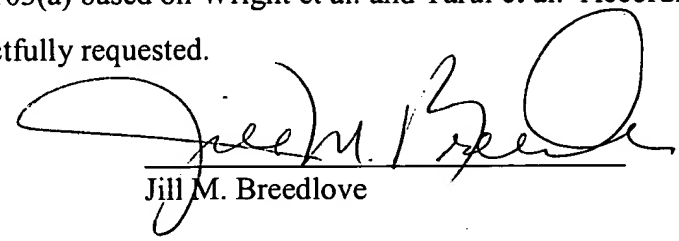
As another example, in a further aspect of the appellant's invention, a method and corresponding system of moving data among zones of a central processing complex comprises moving data from one zone to another zone, where the moving comprises, for example: creating one or more queue entries associated with a message requesting the move; generating one or more fetch memory requests for the one or more queue entries to fetch the data from a memory of the one zone; using the one or more fetch memory requests to fetch the data from the memory of the one zone; placing the fetched data in one or more line buffers; generating one or more store memory requests using the fetched data placed in the one or more line buffers; and employing the one or more store memory requests to store the fetched data in a memory of the another zone, (e.g., as recited in claims 18, 38 and 46).

For the above reasons, appellants respectfully request reversal of the rejection under 35 U.S.C. §103(a) to all claims of Group I.

Conclusion

Appellant respectfully requests reversal of the rejections as set forth in the final Office Action. As explained hereinabove, appellant submits that his claimed invention would not have been rendered obvious by Wright et al. and Tarui et al. These patents do not individually or in combination teach, suggest, or imply appellant's invention, as recited in amended independent claims 1, 18, 21, 38, 41 and 46, and the claims dependent therefrom. In particular, neither reference, alone or in combination, teaches or suggests, dynamic selection of the zone in a central processing complex to which data will be moved.

For all of the above reasons, the appellant alleges error in rejecting his claims as being obvious under 35 U.S.C. §103(a) based on Wright et al. and Tarui et al. Accordingly, reversal of the rejections is respectfully requested.



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Appendix

1. A method of moving data between zones of a central processing complex, said method comprising:

initiating a move of data from one zone of said central processing complex to another zone of said central processing complex, wherein said another zone is dynamically selected; and

moving said data from said one zone to said another zone without using a channel interface and without using processor instructions.

2. The method of claim 1, wherein said data comprises at least one of a command, a response and one or more data areas.

3. The method of claim 1, wherein said one zone is one of an operating system zone and a coupling facility zone and said another zone is the other of said operating system zone and said coupling facility zone.

4. The method of claim 1, wherein said moving is performed by a data mover located within said central processing complex and coupled to said one zone and said another zone.

5. The method of claim 4, wherein said initiating comprises instructing said data mover to perform the move.

6. The method of claim 4, wherein said data mover comprises a fetch state machine and a store state machine employed in moving said data.

7. The method of claim 1, further comprising determining whether said another zone is ready for the move, wherein the move does not take place until said another zone is ready.

8. The method of claim 7, wherein said determining comprises determining whether said another zone is ready to receive a command from said one zone, wherein the move does not take place until said another zone is ready to receive the command.

9. The method of claim 7, wherein said determining comprises checking a buffer to determine whether said another zone is ready.

10. The method of claim 9, wherein said buffer is of a data mover used for said moving.

11. The method of claim 1, wherein said moving comprises determining whether said another zone is ready to receive one or more data areas of said data, prior to moving the one or more data areas from said one zone to said another zone.

12. The method of claim 11, wherein said determining comprising determining whether a predefined command is received from said one zone and said another zone by a data mover employed to perform the move, wherein receipt of the predefined command from said one zone and said another zone indicates said another zone is prepared to receive the one or more data areas.

13. The method of claim 1, wherein said moving comprises:

fetching data from a main memory of said one zone using one or more fetch memory requests generated by a fetch state machine; and

storing the fetched data in a main memory of said another zone using one or more store memory requests generated by a store state machine.

14. The method of claim 13, further comprising placing said fetched data in one or more line buffers, which are used by said store state machine to generate the one or more store memory requests.

15. The method of claim 13, wherein at least one of said one or more fetch memory requests and said one or more store memory requests is generated using information retrieved from an array coupled to at least one of said fetch state machine and said store state machine.

16. The method of claim 13, wherein said fetching comprises processing by said main memory of said one zone said one or more fetch memory requests to fetch said data, wherein one or more responses by said main memory of said one zone to said one or more fetch memory requests are not necessarily in a same order as receipt of the one or more fetch memory requests.

17. The method of claim 13, further comprising tracking progress of the fetching of the data and the storing of the fetched data.

18. A method of moving data between zones of a central processing complex, said method comprising:

moving data from one zone of said central processing complex to another zone of said central processing complex, wherein said another zone is dynamically selected and wherein said moving comprises:

creating one or more queue entries associated with a message requesting the move;

generating one or more fetch memory requests for said one or more queue entries to fetch the data from a memory of said one zone;

using the one or more fetch memory requests to fetch the data from the memory of said one zone;

placing the fetched data in one or more line buffers;

generating one or more store memory requests using the fetched data placed in the one or more line buffers; and

employing the one or more store memory requests to store the fetched data in a memory of said another zone.

19. The method of claim 18, wherein said moving is performed by a data mover located within said central processing complex and coupled to said one zone and said another zone.

20. The method of claim 19, wherein said data mover comprises control logic to perform the creating, and a queued memory line mover to perform the generating of one or more fetch memory requests, the placing of the fetched data in one or more line buffers, and the generating of one or more store memory requests.

21. A system of moving data between zones of a central processing complex, said system comprising:

means for initiating a move of data from one zone of said central processing complex to another zone of said central processing complex, wherein said another zone is dynamically selected; and

means for moving said data from said one zone to said another zone without using a channel interface and without using processor instructions.

22. The system of claim 21, wherein said data comprises at least one of a command, a response and one or more data areas.

23. The system of claim 21, wherein said one zone is one of an operating system zone and a coupling facility zone and said another zone is the other of said operating system zone and said coupling facility zone.

24. The system of claim 21, wherein said means for moving comprises a data mover located within said central processing complex and coupled to said one zone and said another zone.

25. The system of claim 24, wherein said means for initiating comprises means for instructing said data mover to perform the move.

26. The system of claim 24, wherein said data mover comprises a fetch state machine and a store state machine employed in moving said data.

27. The system of claim 21, further comprising means for determining whether said another zone is ready for the move, wherein the move does not take place until said another zone is ready.

28. The system of claim 27, wherein said means for determining comprises means for determining whether said another zone is ready to receive a command from said one zone, wherein the move does not take place until said another zone is ready to receive the command.

29. The system of claim 27, wherein said means for determining comprises means for checking a buffer to determine whether said another zone is ready.

30. The system of claim 29, wherein said buffer is of a data mover used for said moving.

31. The system of claim 21, wherein said means for moving comprises means for determining whether said another zone is ready to receive one or more data areas of said data, prior to moving the one or more data areas from said one zone to said another zone.

32. The system of claim 31, wherein said means for determining comprising means for determining whether a predefined command is received from said one zone and said another zone by a data mover employed to perform the move, wherein receipt of the predefined command from said one zone and said another zone indicates said another zone is prepared to receive the one or more data areas.

33. The system of claim 21, wherein said means for moving comprises:

means for fetching data from a main memory of said one zone using one or more fetch memory requests generated by a fetch state machine; and

means for storing the fetched data in a main memory of said another zone using one or more store memory requests generated by a store state machine.

34. The system of claim 33, further comprising means for placing said fetched data in one or more line buffers, which are used by said store state machine to generate the one or more store memory requests.

35. The system of claim 33, wherein at least one of said one or more fetch memory requests and said one or more store memory requests is generated using information retrieved from an array coupled to at least one of said fetch state machine and said store state machine.

36. The system of claim 33, wherein said means for fetching comprises means for processing by said main memory of said one zone said one or more fetch memory requests to fetch said data, wherein one or more responses by said main memory of said one

zone to said one or more fetch memory requests are not necessarily in a same order as receipt of the one or more fetch memory requests.

37. The system of claim 33, further comprising means for tracking progress of the fetching of the data and the storing of the fetched data.

38. A system of moving data between zones of a central processing complex, said system comprising:

means for moving data from one zone of said central processing complex to another zone of said central processing complex, wherein said another zone is dynamically selected and wherein said means for moving comprises:

means for creating one or more queue entries associated with a message requesting the move;

means for generating one or more fetch memory requests for said one or more queue entries to fetch the data from a memory of said one zone;

means for using the one or more fetch memory requests to fetch the data from the memory of said one zone;

means for placing the fetched data in one or more line buffers;

means for generating one or more store memory requests using the fetched data placed in the one or more line buffers; and

means for employing the one or more store memory requests to store the fetched data in a memory of said another zone.

39. The system of claim 38, wherein said means for moving comprises a data mover located within said central processing complex and coupled to said one zone and said another zone.

40. The system of claim 39, wherein said data mover comprises control logic to perform the creating, and a queued memory line mover to perform the generating of one or more fetch memory requests, the placing of the fetched data in one or more line buffers, and the generating of one or more store memory requests.

41. A system of moving data between zones of a central processing complex, said system comprising:

one zone of said central processing complex and a dynamically selected zone of said central processing complex; and

a data mover coupled to said one zone and said dynamically selected zone to move data from said one zone to said dynamically selected zone without using a channel interface and without using processor instructions.

42. The system of claim 41, wherein said one zone is one of an operating system zone and a coupling facility zone and said another zone is the other of said operating system zone and said coupling facility zone.

43. The system of claim 41, wherein said data mover comprises a fetch state machine and a store state machine employed in moving said data.

44. The system of claim 43, wherein said fetch state machine generates one or more fetch memory requests to fetch data from a main memory of said one zone, and wherein said store state machine generates one or more store memory requests to store the fetched data in a main memory of said another zone.

45. The system of claim 44, further comprising one or more line buffers to hold said fetched data, said one or more line buffers being used by said store state machine to generate the one or more store memory requests.

46. A system of moving data between zones of a central processing complex, said system comprising:

a data mover to move data from one zone of said central processing complex to another zone of said central processing complex, wherein said another zone is dynamically selected and said data mover comprises:

one or more queue entries associated with a message requesting the move;

a fetch state machine to generate one or more fetch memory requests for said one or more queue entries to fetch the data from a memory of said one zone;

one or more line buffers coupled to said fetch state machine to receive the fetched data; and

a store state machine coupled to said one or more line buffers to generate one or more store memory requests using the fetched data of the one or more line buffers, wherein the one or more store memory requests are used to store the fetched data in a memory of said another zone.

* * * * *